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- agents, 3TC, AZT, nevirapine, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.
24. (Withdrawn) A diagnostic method comprising determining the sequence of an acquired immunodeficiency virus envelope gene V3 region after initiating antiretroviral therapy to monitor efficacy of a antiretroviral treatment regimen and where efficacy of the treatment is directly related to decrease of CXCR4 coreceptor use.
25. (Withdrawn) The diagnostic method according to claim 24, wherein the envelope gene encodes gp160 or gp120.
26. (Withdrawn) The diagnostic method according to claim 24, wherein the acquired immunodeficiency virus is selected from the group consisting of HIV-1 and HIV-2.
27. (Withdrawn) The diagnostic method according to claim 24, wherein the antiretroviral therapy is selected from the group consisting of highly active antiretroviral therapy (HAART), protease inhibitors, fusion inhibitors, integrase inhibitors, coreceptor specific agents, 3TC, AZT, nevirapine, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.
28. (Withdrawn) The diagnostic method according to claim 20, wherein the sequence of the envelope gene V3 region is determined from a DNA micro-chip array.
29. (Withdrawn) The diagnostic method according to claim 24, wherein the sequence of the envelope gene V3 region is determined from a DNA micro-chip array.
30. (Currently Amended) A diagnostic method of determining viral tropism comprising:
(a) obtaining a population of patient-derived acquired immunodeficiency virus;
(b) determining CXCR4 coreceptor use; use;
(c) determining CCR5 coreceptor use; use; and
(d) a determining the ratio of acquired immunodeficiency virus using the CXCR4 coreceptor compared to virus using the CCR5 coreceptor.
31. (Currently Amended) A diagnostic method of determining viral tropism comprising:
(a) obtaining a population of patient-derived acquired immunodeficiency virus;
(b) determining CXCR4 coreceptor use; use;
(c) determining CCR5 coreceptor use; use; and

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- (d) a determining the ratio of acquired immunodeficiency virus using the CXCR4 coreceptor compared to virus using the CCR5 coreceptor before initiating antiretroviral therapy to determine a suitable antiretroviral treatment regimen.
32. (Currently Amended) A diagnostic method of determining viral tropism comprising:
(a) obtaining a population of patient-derived acquired immunodeficiency virus;
(b) determining CXCR4 coreceptor use; use;
(c) determining CCR5 coreceptor use; use; and
(d) a determining the ratio of acquired immunodeficiency virus using the CXCR4 coreceptor compared to virus using the CCR5 coreceptor after initiating antiretroviral therapy to monitor efficacy of an antiretroviral treatment regimen and where efficacy of the treatment is directly related to decrease of CXCR4 coreceptor use.
33. (Withdrawn) A diagnostic method comprising transforming cells with an HIV envelope gene variant cloned from a patient infected with HIV, selectively fusing the cells with an indicator cell line expressing an HIV envelope-compatible coreceptor, and assaying for cell fusion before initiating antiretroviral therapy to determine a suitable antiretroviral treatment regimen.
34. (Withdrawn) The diagnostic method according to claim 33, wherein the acquired immunodeficiency virus is selected from the group consisting of HIV-1 and HIV-2.
35. (Withdrawn) The diagnostic method according to claim 33, wherein the antiretroviral therapy is selected from the group consisting of highly active antiretroviral therapy (HAART), protease inhibitors, fusion inhibitors, integrase inhibitors, coreceptor specific agents, 3TC, AZT, nevirapine, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.
36. (Withdrawn) A diagnostic method comprising transforming cells containing a selectively activatable reporter gene construct with an HIV envelope gene variant cloned from a patient infected with HIV, selectively fusing the cells with an indicator cell line containing a constitutively active transcriptional activator of the reporter gene construct and an HIV envelope-compatible coreceptor, and assaying for fusion by detection of reporter gene expression before initiating antiretroviral therapy to determine a suitable antiretroviral treatment regimen.

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37. (Withdrawn) The diagnostic method according to claim 36, wherein the acquired immunodeficiency virus is selected from the group consisting of HIV-1 and HIV-2.
38. (Withdrawn) The diagnostic method according to claim 36, wherein the antiretroviral therapy is selected from the group consisting of highly active antiretroviral therapy (HAART), protease inhibitors, fusion inhibitors, integrase inhibitors, coreceptor specific agents, 3TC, AZT, nevirapine, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.
39. (Withdrawn) A diagnostic method comprising transforming cells containing an HIV Tat-activatable reporter gene construct with an HIV envelope gene variant cloned from a patient infected with HIV, selectively fusing the cells with an indicator cell line containing a constitutively active *tat* gene and an HIV envelope-compatible coreceptor, and assaying for fusion by detection of reporter gene expression before initiating antiretroviral therapy to determine a suitable antiretroviral treatment regimen.
40. (Withdrawn) The diagnostic method according to claim 39 wherein the acquired immunodeficiency virus is selected from the group consisting of HIV-1 and HIV-2.
41. (Withdrawn) The diagnostic method according to claim 39, wherein the antiretroviral therapy is selected from the group consisting of highly active antiretroviral therapy (HAART), protease inhibitors, fusion inhibitors, integrase inhibitors, coreceptor specific agents, 3TC, AZT, nevirapine, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.
42. (Withdrawn) A diagnostic method comprising transforming cells with an HIV envelope gene variant cloned from a patient infected with HIV, selectively fusing the cells with an indicator cell line expressing an HIV envelope-compatible coreceptor, and assaying for cell fusion after initiating antiretroviral therapy to monitor efficacy of an antiretroviral treatment regimen and where efficacy of the treatment is directly related to decrease of CXCR4 coreceptor use.
43. (Withdrawn) The diagnostic method according to claim 42, wherein the acquired immunodeficiency virus is selected from the group consisting of HIV-1 and HIV-2.
44. (Withdrawn) The diagnostic method according to claim 42, wherein the antiretroviral therapy is selected from the group consisting of highly active antiretroviral therapy (HAART), protease inhibitors, fusion inhibitors, integrase inhibitors, coreceptor specific

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agents, 3TC, AZT, nevirapine, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.

45. (Withdrawn) A diagnostic method comprising transforming cells containing a selectively activatable reporter gene construct with an HIV envelope gene variant cloned from a patient infected with HIV, selectively fusing the cells with an indicator cell line containing a constitutively active transcriptional activator of the reporter gene construct and an HIV envelope-compatible coreceptor, and assaying for fusion by detection of reporter gene expression after initiating antiretroviral therapy to monitor efficacy of an antiretroviral treatment regimen and where efficacy of the treatment is directly related to decrease of CXCR4 coreceptor use.
46. (Withdrawn) The diagnostic method according to claim 45, wherein the acquired immunodeficiency virus is selected from the group consisting of HIV-1 and HIV-2.
47. (Withdrawn) The diagnostic method according to claim 45, wherein the antiretroviral therapy is selected from the group consisting of highly active antiretroviral therapy (HAART), protease inhibitors, fusion inhibitors, integrase inhibitors, coreceptor specific agents, 3TC, AZT, nevirapine, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.
48. (Withdrawn) A diagnostic method comprising transforming cells containing an HIV Tat-activatable reporter gene construct with an HIV envelope gene variant cloned from a patient infected with HIV, selectively fusing the cells with an indicator cell line containing a constitutively active *tat* gene and an HIV envelope-compatible coreceptor, and assaying for fusion by detection of reporter gene expression after initiating antiretroviral therapy to monitor efficacy of an antiretroviral treatment regimen and where efficacy of the treatment is directly related to decrease of CXCR4 coreceptor use.
49. (Withdrawn) The diagnostic method according to claim 48, wherein the acquired immunodeficiency virus is selected from the group consisting of HIV-1 and HIV-2.
50. (Withdrawn) The diagnostic method according to claim 48, wherein the antiretroviral therapy is selected from the group consisting of highly active antiretroviral therapy (HAART), protease inhibitors, fusion inhibitors, integrase inhibitors, coreceptor specific agents, 3TC, AZT, nevirapine, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.

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51. (Withdrawn) A diagnostic composition comprising one or more cells comprising an HIV Tat-activatable reporter gene construct, an HIV envelope gene variant cloned from an infected patient, a constitutively active *tat* gene and an HIV envelope-compatible coreceptor.
52. (Withdrawn) The composition according to claim 51, wherein the coreceptor is CXCR4.
53. (Withdrawn) The composition according to claim 51, wherein the coreceptor is CCR5.
- 54-59. (Cancelled)
60. (Currently Amended) A diagnostic method of determining CXCR4 and/or CCR5 coreceptor usage in a patient before initiating antiretroviral therapy, comprising:
 - (a) obtaining patient-derived acquired immunodeficiency virus; and
 - (b) quantitating usage of the CXCR4 and/or CCR5 coreceptor in a patient-derived acquired immunodeficiency virus primary isolate,
whereby the CXCR4 and/or CCR5 coreceptor usage of the patient is used to determine a suitable antiretroviral treatment regimen.
61. (Previously Presented) The diagnostic method according to claim 60, wherein the acquired immunodeficiency virus is selected from the group consisting of HIV-1 and HIV-2.
62. (Previously Presented) The diagnostic method according to claim 60, wherein the antiretroviral therapy is selected from the group consisting of highly active antiretroviral therapy (HAART), protease inhibitors, fusion inhibitors, integrase inhibitors, coreceptor specific agents, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.
63. (Previously Presented) The method according to claim 60, where in the patient-derived acquired immunodeficiency virus sample is obtained from peripheral blood.
64. (Previously Presented) The method according to claim 60, where in the patient-derived acquired immunodeficiency virus sample is obtained from genital secretions.
65. (Previously Presented) The method according to claim 60, where in the patient-derived acquired immunodeficiency virus sample is obtained from cerebrospinal fluid.
66. (Currently Amended) A diagnostic method of monitoring the efficacy of antiretroviral therapy in a patient comprising:

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- (a) obtaining patient-derived acquired immunodeficiency virus samples before and after initiating antiretroviral therapy; and
- (b) quantitating usage of the CXCR4 and/or CCR5 coreceptor in a patient-derived acquired immunodeficiency virus sample, the samples, whereby a decrease of CXCR4 coreceptor use after initiating antiretroviral therapy indicates that the antiretroviral therapy is effective.
67. (Previously Presented) The diagnostic method according to claim 66, wherein the acquired immunodeficiency virus is selected from the group consisting of HIV-1 and HIV-2.
68. (Previously Presented) The diagnostic method according to claim 66, wherein the antiretroviral therapy is selected from the group consisting of highly active antiretroviral therapy (HAART), protease inhibitors, fusion inhibitors, integrase inhibitors, coreceptor specific agents, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.
69. (Previously Presented) The method according to claim 66, where in the patient-derived acquired immunodeficiency virus sample is obtained from peripheral blood.
70. (Previously Presented) The method according to claim 66, where in the patient-derived acquired immunodeficiency virus sample is obtained from genital secretions.
71. (Previously Presented) The method according to claim 66, where in the patient-derived acquired immunodeficiency virus sample is obtained from cerebrospinal fluid.
- 72-75. (Cancelled)
76. (Currently Amended) A diagnostic method of determining the ratio of CXCR4 to CCR5 coreceptor usage in a patient-derived acquired immunodeficiency virus sample of determining a suitable antiretroviral treatment regimen before initiating antiretroviral therapy comprising:
- (a) determining CXCR4 and CCR5 coreceptor use in the sample, sample; and
- (b) determining the ratio of acquired immunodeficiency virus using the CXCR4 coreceptor compared to virus using the CCR5 coreceptor before initiating antiretroviral therapy,
- whereby the ratio of CXCR4 to CCR5 coreceptor usage is used to determine a suitable antiretroviral treatment regimen.

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77. (Previously Presented) The method according to claim 76, where in the patient-derived acquired immunodeficiency virus sample is obtained from peripheral blood.
78. (Previously Presented) The method according to claim 76; where in the patient-derived acquired immunodeficiency virus sample is obtained from genital secretions.
79. (Previously Presented) The method according to claim 76, where in the patient-derived acquired immunodeficiency virus sample is obtained from cerebrospinal fluid.
- 80-83. (Cancelled)
84. (Currently Amended) A diagnostic method of monitoring the efficacy of antiretroviral therapy in a patient comprising the steps of:
 - a) obtaining a first patient-derived acquired immunodeficiency virus sample ~~either before or after~~ the initiation of antiretroviral therapy;
 - b) assaying the first patient-derived acquired immunodeficiency virus sample for CXCR4 and CCR5 coreceptor use;
 - c) determining the ratio of virus in the first patient-derived acquired immunodeficiency virus sample using the CXCR4 coreceptor compared to virus using the CCR5 coreceptor;
 - d) obtaining a second patient-derived acquired immunodeficiency virus sample at a time subsequent to the initiation of antiretroviral therapy and subsequent to the time at which the first sample is obtained;
 - e) repeating steps b) through d) with the second sample;
 - f) determining whether there is a difference in the ratio of CXCR4 and CCR5 coreceptor usage between the first and second patient-derived acquired immunodeficiency virus samples,
whereby an increase in the ratio of CCR5 coreceptor usage, or a decrease in the ratio of CXCR4 coreceptor in the second sample as compared to the first sample, indicates that the antiretroviral therapy is effective.
85. (Previously Presented) The method according to claim 84, wherein the acquired immunodeficiency virus is selected from the group consisting of HIV-1 and HIV-2.
86. (Previously Presented) The method according to claim 84, where in the patient-derived acquired immunodeficiency virus sample is obtained from peripheral blood.

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87. (Previously Presented) The method according to claim 84, where in the patient-derived acquired immunodeficiency virus sample is obtained from genital secretions.
88. (Previously Presented) The method according to claim 84, where in the patient-derived acquired immunodeficiency virus sample is obtained from cerebrospinal fluid.
89. (Previously Presented) The method according to claim 84 wherein the antiretroviral therapy is selected from the group consisting of highly active antiretroviral therapy (HAART), protease inhibitors, fusion inhibitors, integrase inhibitors, coreceptor specific agents, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.
90. (Previously Presented) The method according to claim 89, wherein the nucleoside analogue reverse transcriptase inhibitor is 3TC.
91. (Previously Presented) The method according to claim 89, wherein the nucleoside analogue reverse transcriptase inhibitor is AZT.
92. (Previously Presented) The method according to claim 89, wherein the non-nucleoside analogue reverse transcriptase inhibitor is nevirapine.
93. (Currently Amended) A diagnostic method of monitoring the efficacy of antiretroviral therapy in a patient comprising the steps of:
 - a) obtaining a first patient-derived acquired immunodeficiency virus sample either before or after the initiation of antiretroviral therapy;
 - b) assaying the first patient-derived acquired immunodeficiency virus sample for CXCR4 and CCR5 coreceptor use;
 - c) determining the ratio of virus in the first patient-derived acquired immunodeficiency virus sample using the CXCR4 coreceptor compared to virus using the CCR5 coreceptor;
 - d) obtaining a second patient-derived acquired immunodeficiency virus sample at a time subsequent to the initiation of antiretroviral therapy and subsequent to the time at which the first sample is obtained;
 - e) repeating steps b) through d) with the second sample;
 - f) determining whether there is a difference in the ratio of CXCR4 and CCR5 coreceptor usage between the first and second patient-derived acquired immunodeficiency virus samples,

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whereby a decrease in the ratio of CCR5 coreceptor usage, or an increase in the ratio of CXCR4 coreceptor in the second sample as compared to the first sample, indicates that the antiretroviral therapy is not effective.

94. (Previously Presented) The method according to claim 93, wherein the acquired immunodeficiency virus is selected from the group consisting of HIV-1 and HIV-2.
95. (Previously Presented) The method according to claim 93, where in the patient-derived acquired immunodeficiency virus sample is obtained from peripheral blood.
96. (Previously Presented) The method according to claim 93, where in the patient-derived acquired immunodeficiency virus sample is obtained from genital secretions.
97. (Previously Presented) The method according to claim 93, where in the patient-derived acquired immunodeficiency virus sample is obtained from cerebrospinal fluid.
98. (Previously Presented) The method according to claim 93, wherein the antiretroviral therapy is selected from the group consisting of highly active antiretroviral therapy (HAART), protease inhibitors, fusion inhibitors, integrase inhibitors, coreceptor specific agents, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.
99. (Previously Presented) The method according to claim 98, wherein the nucleoside analogue reverse transcriptase inhibitor is 3TC.
100. (Previously Presented) The method according to claim 98, wherein the nucleoside analogue reverse transcriptase inhibitor is AZT.
101. (Previously Presented) The method according to claim 98, wherein the non-nucleoside analogue reverse transcriptase inhibitor is nevirapine.
102. (Currently Amended) A diagnostic method of monitoring the efficacy of antiretroviral therapy in a patient comprising the steps of:
 - a) obtaining a first patient-derived acquired immunodeficiency virus sample either before or after the initiation of antiretroviral therapy;
 - b) assaying the first patient-derived acquired immunodeficiency virus sample for CXCR4 or CCR5 coreceptor use;
 - c) determining the ratio of virus in the first patient-derived acquired immunodeficiency virus sample using the CXCR4 coreceptor compared to virus using the CCR5 coreceptor;

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- d) obtaining a second patient-derived acquired immunodeficiency virus sample at a time subsequent to the initiation of antiretroviral therapy and subsequent to the time at which the first sample is obtained;
- e) repeating steps b) through d) with the second sample;
- f) determining whether there is a difference in the ratio of CXCR4 and CCR5 coreceptor usage between the first and second patient-derived acquired immunodeficiency virus samples,
whereby the lack of a difference in the ratio of CCR5 coreceptor usage, or the lack of a difference in the ratio of CXCR4 coreceptor usage, between the first and second patient derived virus samples, indicates that the antiretroviral therapy is not effective.
103. (Previously Presented) The method according to claim 102, wherein the acquired immunodeficiency virus is selected from the group consisting of HIV-1 and HIV-2.
104. (Previously Presented) The method according to claim 102, where in the patient-derived acquired immunodeficiency virus sample is obtained from peripheral blood.
105. (Previously Presented) The method according to claim 102, where in the patient-derived acquired immunodeficiency virus sample is obtained from genital secretions.
106. (Previously Presented) The method according to claim 102, where in the patient-derived acquired immunodeficiency virus sample is obtained from cerebrospinal fluid.
107. (Previously Presented) The method according to claim 102, wherein the antiretroviral therapy is selected from the group consisting of highly active antiretroviral therapy (HAART), protease inhibitors, fusion inhibitors, integrase inhibitors, coreceptor specific agents, non-nucleoside analogue reverse transcriptase inhibitors and nucleoside analogue reverse transcriptase inhibitors.
108. (Previously Presented) The method according to claim 107, wherein the nucleoside analogue reverse transcriptase inhibitor is 3TC.
109. (Previously Presented) The method according to claim 107, wherein the nucleoside analogue reverse transcriptase inhibitor is AZT.
110. (Previously Presented) The method according to claim 107, wherein the non-nucleoside analogue reverse transcriptase inhibitor is nevirapine.
- 111-116. (Cancelled)